$$\mathcal{A} = \int_0^1 \frac{u}{\sqrt{x^2+1}} - \frac{u^3}{\sqrt{x^2+1}} \, dx$$

$$= \int_0^1 \frac{u}{\sqrt{x^2+1}} \, dx - \int_0^1 \frac{u^3}{\sqrt{x^2+1}} \, dx$$

$$\mathcal{A} = I_0 - I_1 \quad (U.a)$$